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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/517,042	03/02/2000	Steven J. Iseberg	12650US01	4547

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EXAMINER

LAO, LUN S

ART UNIT PAPER NUMBER

2643

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/517,042

Applicant(s)

ISEBERG ET AL.

Examiner

Lun-See Lao

Art Unit

2643

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### *Introduction*

1. This action is response to the amendment filed on 09-18-2004. Claims 1-40 are pending.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 and 20-28 and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shennib in view of Abel (US PAT. 5,729,612).

Consider claim 1, Shennib teaches a testing probe (see fig.1, 24) for insertion into an ear canal of a test subject;

a stimuli source (speakers 1-6) for transmitting stimuli into the ear canal;

a receiver (23) for receiving response signals from the ear canal in response to the transmitted stimuli; and

a processor for determining from the response signals (probe measurement) whether at least one condition related to the position (measure the in-the-ear-canal response condition correlated by a common reference point) of the testing probe (24) in the ear canal is satisfied (see col.9, lines 12-52 and col. 9, lines 28-37; col.24, lines 29-

Art Unit: 2643

58), but Shennib does not clearly teach pre-test and automatically starting a hearing test after the at least one condition is satisfied.

However, Able teaches pre-test (see figs.1.2, and 6a, 6b and col.15 line 55-col.16 line 50 and automatically starting a hearing test (HRTF) after the at least one condition is satisfied (see col.16 line 25-col.17 line 30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Able into Shennib to provide an advantage of hearing-test system for more accurate.

Consider claims 2-3, Shennib teaches the hearing test device of the stimuli source comprises two audio speakers (see fig.1 (speaker 1-6)), and wherein the receiver comprises a microphone (23); and the stimuli comprise a plurality of pure audio tones (see col.23 lines 20-67).

Consider claim 20, Shennib teaches a method of starting a hearing test, the method employed by a hearing test device having a testing probe positioned in an ear canal of a test subject, the method comprising:

transmitting (see fig.1, (speakers 1-6) and see figs. 5-7)) a plurality of stimuli into the ear canal;

receiving (23) a plurality of response signals from the ear canal in response to the plurality of stimuli;

performing, using at least a portion of the plurality of response signals, at least one test related to the position of the testing probe (24 and see col.9 lines 12-52) in the ear

Art Unit: 2643

canal (see col.24 lines 29-58), but Shrennib does not clearly teach an automatically starting a second, hearing test after the at least one test is passed,

However, Abel teaches an automatically starting a second, hearing test after the at least one test is passed (see fig. 2 and col.15 line 55-col.16 line 67),

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Able into Shennib to provide an advantage of hearing-test system for more accurate.

Consider claims 21-24, Shennib teaches the method of at least one test comprises determining whether the testing probe (see fig.1,24) inherently is stationary in the ear canal (see abstract) and the at least one test is passed when the magnitude of the plurality of response signals is inherently consistent over time (to make sure the testing probe is stationary in the ear canal and see col.17 lines 11-35) lines 38-60) and the method of consistent comprises being within approximately 2dB( see figs. 24-32); and the method of the at least one test comprises determining whether the testing probe (see fig.1, 24) is properly sealed (such as to common reference point) in the ear canal (see col.9 line 12-61).

Consider claims 25-26, Shennib teaches the method of the at least one test is passed when the difference between at least two of the plurality of response signals generated from stimuli at two different frequencies (see fig.5, 16) is inherently no greater than a predetermined value (see col.9 line 11-61); and the method of the predetermined value is approximately 25dB (see figs. 24-32).

Consider claims 27-28, Shennib teaches the method of at least one test comprises determining whether the volume (gain see figs 24-32)) of the ear canal is inherently within a predetermined range (such as thresholds and see col.9 line 11-61); and the method of at least one test is passed when the average of at least two of the plurality of response signals generated from stimuli (see fig.5, 16) at a single frequency is inherently within a predetermined range (such as thresholds and loudness levels and hearing level and see col.9 lines 11-61).

Consider claim 39, Shennib teaches the method of further comprising:

(b) receiving (fig.1, 23,24) a further plurality of response signals from the ear canal in response to the further plurality of stimuli;

(c) performing, using at least the further plurality of response signals, the at least one test related to the position of the testing in the ear canal (see col.9 lines 11-61);

(d) automatically starting (by select automatic) a hearing test if the at least one test is satisfied (see figs. 26-28); but Shennib does not clearly teach an (a) automatically transmitting a further plurality of stimuli into the ear canal if the at least one test is not passed; and repeating steps (a) through (d) if the at least one test is not satisfied.

However, Able teaches an (a) automatically transmitting a further plurality of stimuli into the ear canal if the at least one test is not passed (see figs. 2,6a,6b and col.15 line55-col.16 line 31); and repeating steps (a) through (d) if the at least one test is not satisfied (see col.15 line 55-col.16 line 31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Able into Shennib to provide an advantage of hearing-test system for more accurate.

Consider claim 40, Shennib teaches a method of starting a hearing test, the method employed by a hearing test device having a testing probe positioned in an ear canal of a test subject, the method comprising:

(a) determining whether the testing probe is properly positioned in the ear canal (see col.9 lines 11-61);

(b) automatically (see figs. 26-28 by select automatic) starting a hearing test after it is determined that the testing probe is properly positioned in the ear canal (see col.24 lines 29-col.25 line 34); but Shennib does not clearly teach an automatically repeating steps (a) and (b) if it is determined that the testing probe is not properly positioned in the ear canal.

However, Able teaches an automatically repeating steps (a) and (b) if it is determined that the testing probe is not properly positioned in the ear canal (see figs. 2 and 6a, 6b and col.15 line 55 –col.16 line 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Able into Shennib to provide an advantage of hearing-test system for more accurate.

Art Unit: 2643

4. Claims 4-19 and 29-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shennib (US PAT.6,167,138) as applied to claims 1,20 above and further in view of Zoth (US PAT. 6,231,521).

Consider claim 4, Shennib does not clearly teaches the plurality of pure audio tones are at two alternating frequencies.

However, Zoth teaches the plurality of pure audio tones are at two alternating frequencies (see fig.4, 1,2 and col.9 line 58-col.10 line 16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Zoth into the teaching of Shennib and Able to provide an advantage of using the preferred method is to minimize non-linear effects of the speakers.

Consider claims 5-10, Zoth teaches the two alternating (1,2) frequencies comprise approximately 300Hz and approximately 1000 Hz (see col.8 line 19-31); and the hearing test device of at least one condition comprises a temporal stability condition (see col.8 lines 38-49); and the temporal stability condition is satisfied when the response signals are inherently consistent in magnitude over a period of time (see col.4 line 10-22) and the hearing test device of consistent in magnitude comprises being within approximately 2dB (5db and see col.5 line 45-col.6 line 11); and the hearing test device of at least one condition comprises a spectral response condition (see col.5 line 2-25); and the hearing test device of the spectral response condition is satisfied when the difference between at least two of the response signals generated from stimuli at two different frequencies inherently is no greater than a predetermined value, and the



Art Unit: 2643

average of at least two of the response signals generated from stimuli at a single frequency is within a preselected range (see col.3 lines 45-61).

Consider claims 11-15, Zoth teaches the hearing test device of the predetermined value comprises approximately 25dB (see fig.4, DPOAE and col.5 line 10-col.6 line 1); and the hearing test device of the preselected range is between approximately 32dB and 50dB (see fig.4, DPOAE, and col.5 line 10-col.6 line 11); and the hearing test device of the stimuli source (see fig.4,11) comprises first and second audio speakers (12), each on a separate audio channel; and the hearing test device of the at least one condition comprises a channel balance condition (see fig.4 1 and2 (attenuators)) and the hearing test device of the channel balance condition is satisfied when the difference between at least two response signals generated in response to the transmission of at least one stimulus by each of the first and second audio speakers inherently is no greater than a predetermined value for at least one frequency (see col.10 lines 34-51).

Consider claims 16-19, Zoth teaches the hearing test device of the at least one condition comprises a plurality of conditions, and wherein the plurality of conditions comprise at least a temporal stability condition, a spectral response condition, and a channel balance condition (see col.8 lines 38-60) and the hearing test device of the hearing test comprises a distortion product otoacoustic emissions test (see col.3 line 62-col.4 line 2); and the hearing test device of the predetermined value is approximately 4dB (5db and see col.5 line 63-col.6 line 11); and the hearing test device of the processor, if the at least one condition is not satisfied, automatically inherently causes

Art Unit: 2643

the transmission of additional stimuli for re-determining from at least signals responsive to the additional stimuli whether the at least one condition has been satisfied (see col.3 line 62-col.4 line 62).

Consider claim 29, Shennib does not clearly teach the method of the predetermined range is between approximately 32dB and 50dB.

However, Zoth teaches the method of the predetermined range is between approximately 32dB and 50dB (see fig.4 DPOAE and col.5 line 15-col.6 line 11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Zoth into the teaching of Shennib and Able to provide an advantage of using a phase analysis system described below which, by contrast with the conventional methods of frequency and amplitude analysis is suitable for automated evaluation.

Consider claims 30-34, Zoth teaches the method of at least one test comprises determining whether first and second channels(see fig.4, 1,2) are balanced (by attenuation); and the method of at least one test is passed when the difference between at least two of the plurality of response signals generated in response to at least one stimulus on each of the first and second channels inherently is no greater than a predetermined value for at least one frequency (col.10 line 8-50); and the method of the predetermined value comprises approximately 4dB (see col.5 line 63-col.6 line 11); and the method of at least one test comprises a plurality of tests, and wherein the plurality of tests comprises inherently determining (by automated) whether the testing probe is stationary in the ear canal, whether the testing probe is properly sealed in the

ear canal, whether the volume of the ear canal is within a predetermined range, and whether first and second channels transmitting the plurality of stimuli are balanced (see col.8 lines 38-60); and the method of the hearing test is a distortion product otoacoustic emissions test (see col.6 line 58-67).

Consider claim 33, Shennib teaches the method of at least one test comprises a plurality of tests, and wherein the plurality of tests comprises inherently determining (by automated) whether the testing probe is stationary in the ear canal, whether the testing probe is properly sealed in the ear canal, whether the volume of the ear canal is within a predetermined range, and whether first and second channels transmitting the plurality of stimuli are inherently balanced (see abstract).

Consider claims 35-38, Shennib teaches the method of further comprising displaying an indication of the volume (gain) of the ear canal (see figs 24-32); and the indication is a bar graph (see figs 24-32) and the method of further comprising displaying an indication of the amount of noise (noise or distortion) being received by the hearing test device (see figs. 24-32) and the method of the indication is a bar graph (see figs. 24-32).

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-40 have been considered but are moot in view of the new ground(s) of rejection.

**Conclusion**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Engebretson (US PAT. 4,548,082) is recited to show other related the hearing teat apparatus and method having automatic staring functionality.

7. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:(703) 872-9306

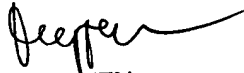
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (703) 305-2259 The examiner can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao, Lun-See  
Patent Examiner  
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**DUC NGUYEN**  
**PRIMARY EXAMINER**